Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

FIREWOOD

FOR YOUR FIREPLACE

- SELECTION
- PURCHASE
- USE

Leaflet No. 559

U.S. DEPARTMENT OF AGRICULTURE • FOREST SERVICE

FIREWOOD FOR YOUR FIREPLACE:

- Selection
- Purchase
- Use

Where can I get good firewood? How is it sold? What safety measures should be followed when burning firewood? Is the fireplace efficient for home heating?

These are just a few of the questions that need answering for the many people who plan to make greater use of the home fireplace.

A fireplace supplies radiant energy that can bring quick comfort to a cold room. In spring and fall, a fire will dispel early morning and evening chills more economically than a large heating system, since less fuel is consumed and a large volume of heat is quickly produced. Should storms or power failures interrupt the normally reliable means of heating and cooking, it is reassuring to have a fireplace for emergency use.

A fireplace, however, is not the most efficient means of producing heat for the home. An open fireplace draws large quantities of warm air from the home, which is replaced by cold outside air. Modern woodburning stoves that have automatic draft controls are more efficient since they draw smaller quantities of air. These stoves are often sold in rural areas.

USING WOOD IN YOUR FIREPLACE

Some fuels are pollution and health hazards, but wood is much lower in irritating pollutants than most fuels. Most individuals generally consider wood smoke with nostalgia. Wood smoke permeating the air makes our visit to historical villages seem all the more authentic.

Wood has a low ash content. It burns cleanly, leaving only a minimum of waste as ash. The ash that remains can be useful for gardening; applied to the soil it's a valuable fertilizer.

In using wood, you are utilizing a renewable fuel resource. Coal, oil, and gas are limited resources. Once used, they cannot be replaced. But new trees can be grown, so that after a few years, more wood is available. Wood has the advantage of being readily available, easily cut, and relatively inexpensive. Fossil fuels, by contrast, require expensive equipment, plus considerable manpower and energy, to locate, extract, and process.

The wood that you use in your fireplace might very well be unusable in any other way. By burning it in your fireplace, you can help reduce the burdensome piles of wood waste riddling our environment in woodlands, urban dumps, and around wood industries. Reclaiming it for firewood provides a worthwhile environmental alternative.

Generally speaking, a standard cord of air dry, dense hardwood weighs approximately 2 tons and provides as much heat as 1 ton of coal, or 150/175 gallons of No. 2 fuel oil, or 24,000 cubic feet of natural gas.

WHERE TO GET FIREWOOD

You can get wood fuel from trees, growing in the woods, that are considered undesirable. This includes trees that are poorly formed, diseased, of little-used or weed species—like pin cherry—and genetically inferior individuals. All such trees pose problems for the forest manager. They occupy valuable growing space, which thrifty young trees might well use for continuing development. When diseased, these trees pose a hazard to nearby healthy trees. If genetically inferior, they may continue to reproduce and could keep the forest area full of poor-quality trees for generations to come. Weeding them out often costs more than can be returned from their sale. But fuelwood markets may make this forest-improvement measure economical.

Contact your local State forestry office for assistance in identifying less thrifty trees that should be removed. Be sure to get permission to cut or remove trees from property other than your own.

Logs of elm trees killed by Dutch elm disease can be burned as firewood. These elm logs should be used the first winter or before the spring following the tree's death. This prevents the disease-carrying beetles from emerging and infecting healthy elms. If you can't burn all the dead elm wood, before spring, you should remove and burn the bark so that the larvae and eggs beneath this bark are destroyed.

You can also get fireplace wood from dumps and landfills. Since many local ordinances forbid open burning, the quantity of dead, discarded trees keeps mounting unnecessarily on these lands which are sorely needed for the disposal of other solid wastes. As much as 30 percent of the debris in some town and city dumps consists of reusable wood fibers, including the logs, limbs, and tops of trees toppled by storms.

Fireplace wood is also available as industrial wood scraps. Sawmills accumulate scrap materials such as slabs, trim, and edgings in their millyards. Lumber companies often offer these materials as firewood at minimal cost, since this use will alleviate hauling and burning problems for them. Power companies might also offer the logs, limbs, and tree tops that result from their powerline maintenance efforts.

Firewood may be available from the National Forests. Check with your nearest Forest Service District Ranger for more detailed information. State Foresters, county Extension Agents, and county and city foresters can also provide information on local sources of firewood.

HOW TO BUY FIREWOOD

The most common measure of firewood volume is the cord. A standard cord can be described as a well-stacked pile of logs, 4 by 4 by 8 feet. Since few people burn wood in 4 or 8 foot lengths, most sales are a "face cord"—that is, a 4 by 8 foot face, cut into desired lengths. A "face cord" of 16-inch-long pieces is really one third of a standard cord.

To determine the volume of firewood in cords, the wood must be first properly stacked (see fig. 1). Then, measure the dimensions of the stack in feet. Multiply the width by the height by the length to obtain the total cubic feet. Then divide this figure by 128, which is the number of cubic feet of wood in a standard cord. For example, if you purchase firewood in 16-inch (1.33-foot) lengths and find that after you stack it tightly, it forms a pile 4 feet high and 8 feet long, you have one-third of a cord: 1.33 × 4 × 8 feet = 42.6 cubic feet; this, divided by 128 = .333 cord.

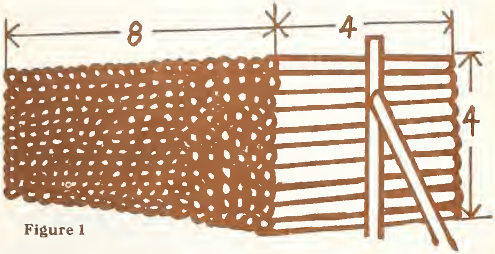


Figure 1

In some parts of the country firewood is more commonly sold by the ton. A ton of air-dry, dense hardwoods (such as oak, hickory, maple) is equal to approximately one-half of a cord. If you buy your wood by weight instead of volume, look for the driest wood. Don't pay for extra water.

Logs are sold in different lengths and thicknesses. The sizes you buy should depend on the size of your fireplace and the amount of time you want to take to get your fire going. Purchase logs that will fit when laid across your grate. Logs too large to burn readily may be split. Extra heavy logs may be split to more manageable size. Short lengths are generally easier to split than longer logs; straight-grained knot-free wood is easier than crooked-grain. Green or wet wood splits more readily than seasoned wood and softwoods usually split more readily than hardwoods. Elm, blackgum, and locust are so difficult to split that they are rarely used as kindling. When kindling is needed, short lengths of straight-grained cottonwood, aspen, fir, and pine will split readily and prove most satisfactory. Small twigs and branches found in your yard and wood wastes found around sawmills are also good as they often do not have to be split and dried. When you buy wood request a mixture of wood species and diameter sizes. Although the wood should be generally sound, don't worry about small pockets of rotten wood you may find in the logs.

Most wood species will not burn if freshly cut, so the wood you purchase should be reasonably dry, or "seasoned." The surest way of having dry wood is to purchase it several months prior to using it. Splitting logs hastens drying. Split logs or small round logs should be stacked outside under a roof for 6/10 months before burning.

Gathering fuelwood and cutting and splitting it to the proper size can be a most enjoyable pastime for the entire family. For a number of people such healthy outdoor exercise as sawing and splitting wood is part of the fun of having a fireplace.

BEST WOOD FOR BURNING

Choosing a kind of firewood to burn in your fireplace is much like selecting a favorite wine or cheese, since each wood species can offer something different in aroma or heat value. The fuelwood connoisseur will want to choose his wood carefully and weigh his needs and tastes before building his fire.

Softwoods, like pine, spruce, and fir, are easy to ignite because they are resinous. They burn rapidly with a hot flame. However, since a fire built entirely of softwoods burns out quickly, it requires frequent attention and replenishment. This characteristic of softwoods can be a boon if you want a quick warming fire or a short fire that will burn out before you go to bed or before you step out for the evening.

For a long lasting fire it is best to use the heavier hardwoods such as ash, beech, birch, maple, and oak. These hardwood species burn less vigorously than softwoods and with a shorter flame. Oak gives the most uniform and shortest flames and produces steady, glowing coals. When you have several oak logs burning in your grate, you can settle back for a steady show of flame.

Aroma is best derived from the woods of fruit trees, such as apple and cherry, and nut trees, such as beech, hickory, and pecan. Their smoke generally resembles the fragrance of the tree's fruit. Wood from fruit and nut trees often sells for more per cord than wood with greater heating values, but they are generally steady producers of flame.

By mixing softwoods with hardwoods you can achieve an easily-ignited and long-lasting fire. Later, by adding some fruit or nut woods, you will capture the nostalgic wood smoke aroma as well.

The heat that a fireplace log produces depends on the concentration of woody material, resin, water, and ash. Since woods are of different compositions, they ignite at different temperatures and give off different heat values; therefore, it is beneficial to mix light and heavy woods to achieve the ideal fire.

The table below shows the relative ratings of a variety of dried woods.

RATINGS FOR FIREWOOD

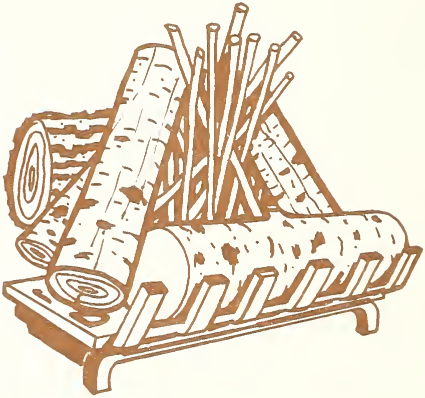
HARDWOOD TREES	*Relative amount of heat*	*Easy to burn*	*Easy to split*	*Does it have heavy smoke?*	*Does it pop or throw sparks?*	*General rating and remarks*
Ash, red oak, white oak, beech, birch, hickory, hard maple, pecan, dogwood.	High	Yes	Yes	No	No	Excellent.
Soft maple, cherry, walnut	Medium	Yes	Yes	No	No	Good.
Elm, sycamore, gum	Medium	Medium	No	Medium	No	Fair—contains too much water when green.
Aspen, basswood, cottonwood, yellow-poplar	Low	Yes	Yes	Medium	No	Fair—but good for kindling.
SOFTWOOD TREES						
Southern yellow pine, Douglas-fir	High	Yes	Yes	Yes	No	Good but smoky.
Cypress, redwood	Medium	Medium	Yes	Medium	No	Fair.
White-cedar, western redcedar, eastern redcedar	Medium	Yes	Yes	Medium	Yes	Good—excellent for kindling.
Eastern white pine, western white pine, sugar pine, ponderosa pine, true firs.	Low	Medium	Yes	Medium	No	Fair—good kindling.
Tamarack, larch	Medium	Yes	Yes	Medium	Yes	Fair.
Spruce	Low	Yes	Yes	Medium	Yes	Poor—but good for kindling.

HOW TO BUILD A BETTER FIRE

There are many ways of building a fire. The basic principle to be aware of is that you set a match to easily ignitable tinder, which in turn ignites the kindling, which in turn ignites the larger firewood. The following method has proved highly successful. Place two logs on the iron grate or fire basket and lay the tinder between them (see fig. 2). Dry scrap paper may be more readily available than the classical tinders such as hemlock twigs and cedar or birch bark. Next, place above this a small handful of dry twigs or split softwood kindling. Then place small, dry logs over this base. A tepee formation of kindling and small branch wood will ease your fire through early combustion stages until the logs are aglow. Place these logs close. The narrow air spaces between them promote better drafts. The heat reflected between adjacent surfaces aids in raising and maintaining combustion temperatures.

Generally, no more than four logs are needed to make a good fire. Adjust the logs and maintain the flames by pushing the ends into the flame from time to time. Add kindling and new logs as needed to rekindle a dying glow. Rake coals toward the front of the grate before adding new logs. Add new logs at the rear of the fireplace; there they will reflect light and heat into the room.

Ashes should only be left to accumulate within an inch or two at the bottom of the grate. A greater accumulation can ruin andirons and block the flow of air to the fire. The ashes under the grate are important for they form a bed for the glowing coals that drop through the grate. They concentrate heat and direct drafts of air up to the base of the fire. By covering the burning logs these excess ashes then can be used to check a flaming fire. A fire "banked" with ashes in this way will hold glowing coals for 8/10 hours, making it easier to rekindle the flames.



HOW TO BUILD A SAFE FIRE

Make sure the room is well ventilated, the damper open, and the flue unobstructed before lighting your fire. Poor ventilation will cause the fireplace to smoke. Avoid burning wet or green wood. Place a screen in front of your grate to catch any sparks that fly. Keep a fire extinguisher handy. Keep other combustibles at a distance. Never use flammable liquids indoors to light your fire.

Dry wood when burnt with abundant oxygen produces carbon dioxide, water, and a small amount of residual ash—all of which are easily recycled by green plants. Burning green or wet or highly resinous wood results in increased production of wood tars and several associated "smoke" products. These tars and the wood extracts may coat the chimney flue and could result in a chimney fire if ignited.

Some modern homes, especially those with electric heating, are constructed so air-tight that an air vent may have to be installed, or a window opened slightly. When wood or charcoal is burned without sufficient oxygen, some carbon monoxide will be released.

Franklin stoves or glass fireplace doors offer a possible means of further reducing the amount of smoke that escapes into the room. If, however, the chief reason for poor fireplace performance is faulty construction, the only safe solution is proper rebuilding.

When softwoods are used in the fire building, brief, vigorous fires result without a bed of long-lasting coals. Within a short time, when any unburned fuels have been pushed to the rear of the grate and the fireplace opening is covered with a fine mesh screen, a softwood fire can be presumed safe enough to leave unattended.

Some resinous woods are best used as stove woods or only with caution in the fireplace. Hemlock, larch, spruce, and juniper all contain moisture pockets in the wood. Upon heating, trapped gases and water vapor build pressure in these pockets and "pop" with great vigor. This is another reason for reducing moisture content as much as possible before burning any firewood.

With the proper size and kinds of firewood and a little practice at laying up the fire, you can enjoy the warmth and beauty of your fireplace all winter long. Sit back and relax, "while the blazing logs bring back the glow of summer suns of long ago."

Issued July 1974

This leaflet was originally issued jointly by the Northeastern Forest Experiment Station and the Northeastern Area, State and Private Forestry, USDA Forest Service, Upper Darby, Pa., as "Enjoy Your Fireplace, Especially During the Energy Crisis," in November 1973. The authors were Clyde Hunt, research geneticist (S&PF) and Rita Rammrath, information specialist (Research).

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 — Price 25 cents.
Stock Number 0100—03195.